



# ALLISON

## SHORT FORM CATALOG #564

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## INSTRUMENTS OF QUALITY

### Continuously Variable Passive Filters

Spectrum Equalizers

Spectrum Analyzers

Modular Amplifiers

Random Noise Sources

Automatic Inspection Units

Multiple Oscillators

Instrumentation Modules

Custom Instrumentation



*Proved dependable in years of service*

**Allison Laboratories, Inc.**

P.O. BOX 515 LA HABRA, CALIFORNIA 90631



## VARIABLE FILTERS

wide dynamic range

no internal noise

flat pass bands

steep continuous attenuation

negligible ringing effect

### SERIES 2

The Model 2 Series are variable passive network filters with independent high cutoff and low cutoff sections. Each section has a range switch that changes the cutoff in octave steps with a vernier dial that tunes over a range of one octave. The attenuation rate is 30 db per octave and they may be cascaded for increased attenuation. Two filters give 60-70 db per octave. The smooth pass band is flat  $\pm 1$  db over 80% of the pass band. It may be tuned to a bandwidth as narrow as 1/3 octave. The maximum input voltage is 2 volts. The input and output impedance is 600 ohms.

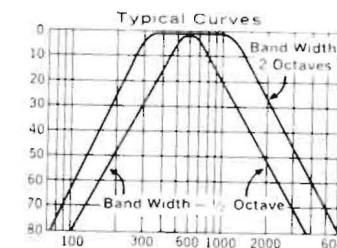
Size: 7-1/4" high, 7-1/2" deep, 17-1/2" wide.

Rack model is mounted on a 7" panel with 6-1/2" behind panel.

MODEL	RANGE	SH.WGT.	PRICE
2AB	15-20,000 cps	24#	\$495
2B	60-20,000 cps	20#	\$395
2C	9- 672kcps	18#	\$375
2D	250 cps-80kcps	19#	\$385

Rack mount is the same price and shipping weight for all models.

Add 15% of the standard unit price for hermetically sealed capacitors.



### MODEL 201

The new Model 201 extends into the sub-audio range while retaining all of the desirable characteristics of the 2 series, such as excellent transient handling capability, ability to handle small signal parameters and no active elements. The low noise, low distortion and good transient handling capacities of this filter make it excellent for studies of low level transient phenomena, such as encountered in heart studies, geophysical work, thermocouples and low frequency vibrations. With high cutoff only, the filter will pass DC to the cutoff frequency.

A chart is provided on the panel for reading the multiplier dial directly into cps.

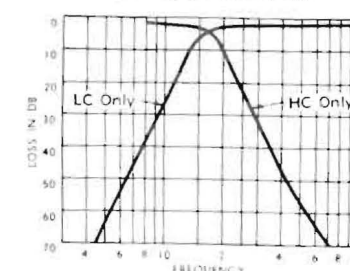
Low cutoff section . . . . . 1 to 128 cps  
High cutoff section . . . . . 2 to 256 cps

Size: 7-1/4" high, 17-1/2" wide, 7-1/2" deep.  
Rackmount: 7" high, 19" wide, 6-1/2" deep.

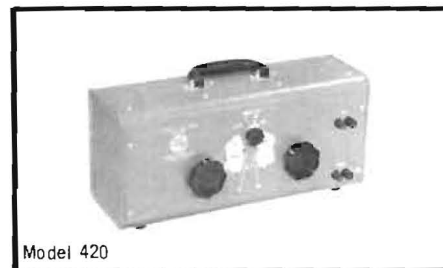
201 Sh. Wgt. 35# \$725  
201 R Rack Mount Sh. Wgt. 35# \$725

Hermetic Capacitors Not Available

### TYPICAL CURVES







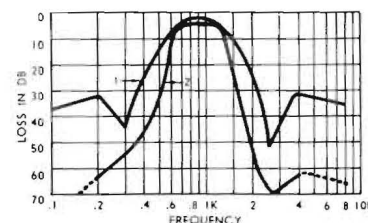
Model 420

Designed as an inexpensive general purpose filter for laboratory and production use, the 420 is very simple to operate and is direct reading with a single knob control for each section covering a range from 20 to 20,000 cps. A selector is provided for switching the filter out, low cutoff only, high cutoff only, or band pass mode of operation. There is 20 db or more attenuation per octave for the first octave, with attenuation outside the pass band exceeding 25 db at all frequencies beyond an octave away from cutoff frequency. Minimum bandwidth — approximately 1/2 octave. Maximum input—2 volts. Impedance—600 ohms.

Portable — excluding knobs and handle: (Shown) 17" long, 5-3/4" deep, 8" high.

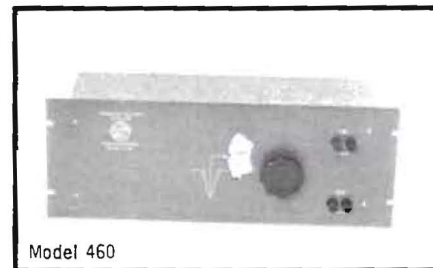
Available also in rack mount case with 7" x 19" panel and 5-3/4" behind the panel.

TYPICAL CURVES



Curve #1—1 Model 420  
Curve #2—2 Model 420 Filters in Series.

420	Sh. Wgt. 24#	\$385
420R Rack Mount	Sh. Wgt. 30#	\$385



Model 460

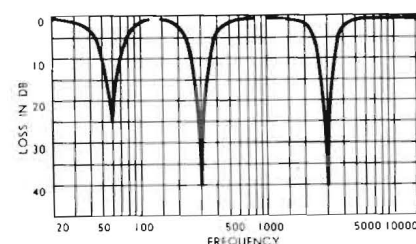
This filter also features the single knob tuning. The rejection band may be moved continuously over the range of 20 to 20,000 cps. The reject band is slightly less than 1 octave wide at the -3 db points. Attenuation at the bottom of the reject band varies as shown in the curves below. It can be used to eliminate single components as, interfering hum, the resonant peak of an accelerometer, a fundamental or constant tone to facilitate analyses of the remaining frequency spectrum. 460 Filters used in series eliminate additional frequencies.

Impedance . . . . 600 ohms.  
Reject band . . . Less than 1 octave wide.  
Maximum input . . 2 volts.

Portable: 17" long, 5-3/4" deep, 8" high.

Available also in rack mount.  
(Shown with 7" x 19" x 5-3/4".)

TYPICAL CURVES



460	Sh. Wgt. 24#	\$395
460R Rack Mount	Sh. Wgt. 30#	\$395



Model AL 483 Input  
Model AL 484 Output

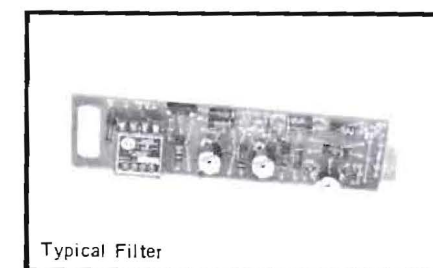
## IMPEDANCE MATCHING TRANSFORMERS

These units are used for applications where it is inconvenient to match impedances of 600 ohms. The AL-483 Input Transformer is an autotransformer designed to work from approximately 10,000 ohms to the 600 ohm circuit of the filter. The AL-484 Output Transformer is designed to match the 600 ohms impedance of the filter into the grid of a vacuum tube or a VTVM. The output transformer has an impedance ratio of 600 to 45,000 ohms. A terminating resistor is built into the transformer to properly terminate the filter.

Each transformer is encased in a mu-metal case and a grounded steel case.

In the event that high impedance inputs are required in frequencies above or below the above limits, refer to the Model 659 amplifier. These units have input impedance of 40,000 ohms and match the filter using a 600 ohm series resistor. The frequency coverage can be extended in this manner from 10 cps to 500 kcps.

AL-483 Input Autotrans.	
10,000/600 ohms	\$35
AL-484 Output Trans.	
600 ohms/Grid	\$35



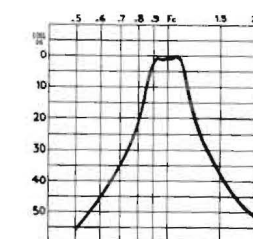
Typical Filter

## FIXED 1/3 OCTAVE FILTERS

Fixed 1/3 octave filters having excellent and uniform response. Each model consists of 1 decade of 10 filters, case complete with power supply. These are passive networks using solid state isolation and amplification.

Standard filters are on ASA preferred center frequencies. Special filters may be ordered to other frequencies and down to 5% bandwidth. Individual filters are also available cased or uncased as desired.

TYPICAL CURVE ALL FILTERS



MODEL	FREQUENCY	PRICE
240	2.5 - 20	\$2850
241	25 - 200	1500
242	250 - 2000	900
243	2500 - 20000	850
244	25000 - 200000	850

Individual filters by quotation

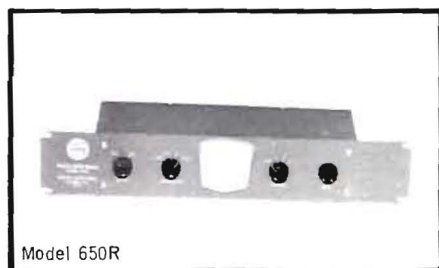
See also 1/3 octave analyzer, page 8



Model 650

## RANDOM NOISE SOURCES MODEL 650

A superior random noise source for general use. Using the Model 655 Module as a source it provides references and controls. Filters are also provided for equal energy per octave (Pink) noise, 12 db/ octave roll off above 1000 cps and a 100 to 300 cps narrow band. The unit is non microphonic and has a maximum output of 1.5 vrms in the equal energy per cycle setting. This is widely used as a signal source for shake tables, acoustic testing, etc. Available also in rack-mount case on a 3-1/2" x 19" panel x 6-1/2" Standard model uses the Model 655 source at the right. Special models may be made with the Model 685 at an increased price.



Model 650R

### PRICES

Portable	Battery	\$295
Portable	AC	310
Rack Mount	Battery	310
Rack Mount	AC	325



Model 655

## MODEL 655

An extremely useful noise module for many applications. Commonly internally mounted for test and calibration signals in various instruments. Requires only 22.5 VDC to produce random noise having good Gaussian distribution of amplitudes and uniform spectral density. A silicon diode furnishes the signal source for a germanium transistorized amplifier. Frequency response is 5cps to 30kcps and typically produces .2 volts rms into 10K ohm load. Temperature stability is approximately  $\pm 3\text{db}$  over 0° to 50°C.

Price - 1 to 9 \$75.00 each

## MODEL 685

Same size and power requirements as the 655 but is all silicon construction. Outstanding for temperature stability, within 2db from 0° to 60° C.

Price - 1 to 9 \$80.00 each

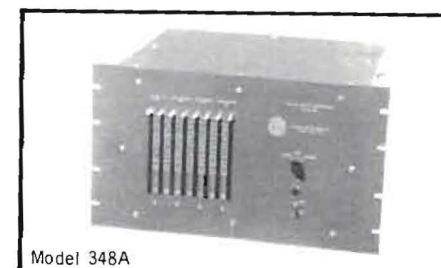
## MODEL 681

Again same size and construction as Model 655 except frequency response from 10cps to 1 mcps. Lower voltage out. \$80.00 each

## MODEL 657

High temperature device having all silicon active elements plus tantalum capacitors. Performance 5cps to 150kcps over temperature range of -20°C to +85°C. \$100.00 each

Write for quantity prices and specifications on all models.



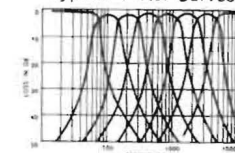
Model 348A

## OCTAVE BAND EQUALIZERS AND SPECTRUM SHAPERS MODELS 318-19-48-49

These newly redesigned instruments present a series of octave band filters sets for many uses. They may contain 8 or 9 octave bands on the new preferred frequency centers starting at 31.5cps and up to 16kcps. All filters are fed in parallel on the input and have individual new slide type attenuators to control the level in each band. The Models 318 and 319 are complete filters sets for use with any signal source.

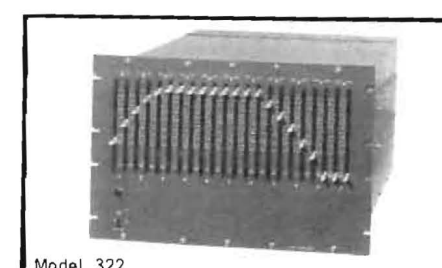
Models 348 and 349 are similar to the above two models but in addition have a random noise source plus input and output amplifiers. This provides a complete shaped spectrum signal for driving shake tables, high level acoustic test facilities, and many other applications.

Typical Filter Curves



Size: 10 1/2" x 19" Rack Panel  
14" behind the panel.

Model	Description	Price
318A	8 Band Filter	\$1350
319A	9 Band Filter	1500
348A	8 Bands w/ noise generator	1650
349A	9 Bands w/ noise generator	1850



Model 322

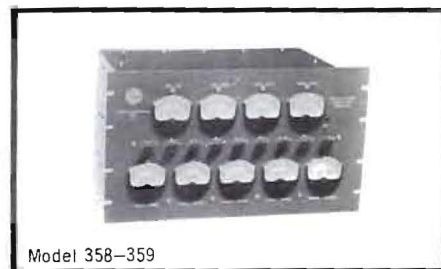
## MODEL 322

This new instrument is a continuation of the 300 series at left. The use of new slide attenuators plus excellent 1/3 octave filters give greater definition to shaped spectrums over the center frequencies from 20 cps to 250 kcps. A maximum of 22 filters may be included in this range such as 20cps to 2500cps. The complete 1/3 octave series are in decades starting with 25, 31.5, 40, 50, 63, 80, 100, 125, 160 and 200cps. Centers above and below may be obtained as a factor of 10, 100 or 1000 above or below these frequencies. A random noise source is included in this instrument plus its associated power supplies, amplifiers and circuitry. This makes a complete signal source for shaped spectrums. For typical filter curves, see page 4.

SIZE: 12 1/4" X 19" rack panel 19" behind the panel.

Prices start at \$3850.00.



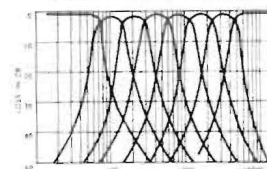


Model 358-359

## MODELS 358-359

These are simultaneous octave band analyzers having either 8 or 9 octave band filters. The filters are fed in parallel and each channel is provided with a meter circuit on the output. The meters read in decibels the energy in each octave of the spectrum. Specially damped meter circuits have good response to complex signals such as random noise. The instantaneous readout may be recorded from individual outputs or photographed. Octave bands are on preferred frequency centers over the range of 31.5cps to 16kcps. Any 8 or 9 bands may be selected.

TYPICAL CURVES



Size: 19" wide, 10½" high, 15" deep.

PRICES Model 358R \$2635 Model 359R \$2990



Model 533

## MICROPHONE ACCESSORY MODEL 533

7



Model 532.

## OCTAVE BAND ANALYZER MODEL 532

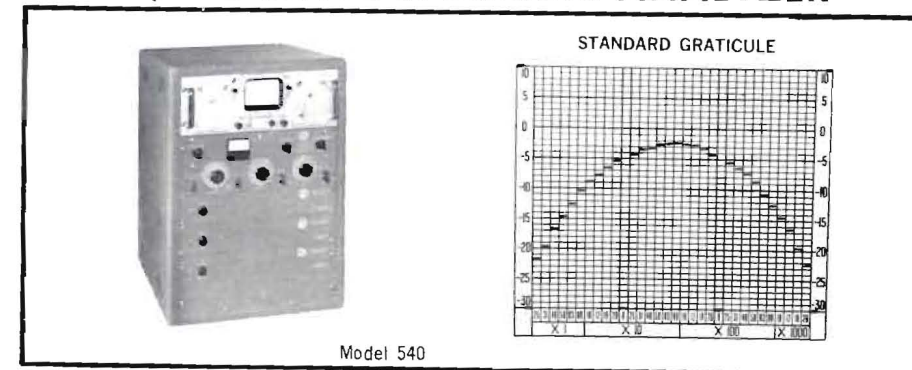
The Allison 532 Octave Band Analyzer is a small lightweight spectrum analyzer that is exceedingly easy to operate. The instrument consists of a complete analyzing circuit including attenuator and meter. Used with a sound level meter it will measure signal components in octave bands 56 db below the overall signal level. Used with the Model 533 shown at the right, it will measure and analyze sound from 65 to 130 db sound pressure level. The 532 is also suitable for use with recorders and microphone preamplifiers and similar equipment. It is useful for the octave band analysis of environmental noises, complex audio signals, production line testing, noise level acceptance and speech interference levels.

SIZE: 6-¾" × 6-¾" × 5". WEIGHT: 7#  
PRICE: \$425.00

The Model 533 Accessory Kit consists of a very stable and reliable dynamic microphone, tripod, cable and input transformer. This arrangement permits the Model 532 to be used as a sound level meter for sound pressure levels above 65 db. The kit has a 25 foot cable furnished and a 100 foot extension is available. The combination 532 and 533 will make industrial sound survey and analysis simple and accurate.

WEIGHT: 4#  
PRICE: \$135.00  
100' EXTENSION CABLE 18.75

## 1/3 OCTAVE SPECTRUM ANALYZER



Model 540

## MODEL 540

The Allison Model 540 is a new and exciting instrument for 1/3 octave spectrum analysis with many applications. The extreme flexibility of of filter selection over a range of 2.5 cps to 200 kcps makes it suitable for standard or special purpose tests. A repetitive .1 second display of the spectrum allows high speed testing of product or immediate evaluation of design changes and adjustments.

The input signal is fed to a bank of 1/3 octave passive network bandpass filters. The individual filter output is rectified and stored in a capacitor. Each capacitor is sampled consecutively 10 times per second by a motor driven commutator switch. The switch output is amplified logarithmically and the signal is displayed on the calibrated oscilloscope screen shown above. Simultaneously calibration signals are displayed to show instrument accuracy during the test. The filters are continuously open and all signals are received, integrated and stored for display.

The standard Model 540 shown above covers the range of 25 cps to 20,000

cps. Filters are Allison standard Models 241, 242 and 243 (Page 4).

The newness of this instrument prevents a previous background of applications; however, the basic versatility of the unit shows that uses are limited mainly by the frequency range, voltage range and the imagination of the user. It will display the analysis of any repetitive simple or complex waveform or pulses within the above limitations. Many accessories to the standard device can adapt it to various test situations such as a microphone for acoustic input, an accelerometer for vibration pickup, etc. Revisions to the standard model can be made to adapt it to a variety of situations such as narrow band filters or a combination of standard 1/3 and 1/6 octave filters to increase resolution of certain areas, linear rectification only for expanded scale close tolerance measurements, multiple speed scanning motors for recording requirements, special outputs per channel to operate go-no go apparatus. Calibration references permit readout in voltage, decibels re 1 millivolt or sound pressure level.

SIZE: 22" wide × 30" high × 18" deep.  
WEIGHT: 300#  
PRICE: \$7250.00

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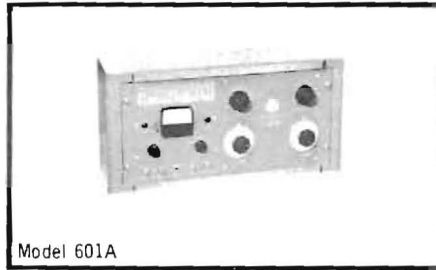


## MULTIPLE FREQUENCY OSCILLATOR MODEL 541

The Model 541 provides a long felt need for a simultaneous multiple frequency test signal. Variations of packaging can provide from 2 to 50 frequencies in in the range from 2.5 cps to 200 kcps. Individual amplitude controls allows shaping of the spectrum as desired. Switches and meters may be added to give the individual or overall reference level.

Primarily designed as a known, controllable test signal for the Model 540 it is adaptable by changing frequencies or number of oscillators. Other uses include shaker table drive signal, programable oscillator, etc. The 541 features all solid state circuitry and self contained power supply. Output is .15 Vrms per frequency and approximately .8 Vrms for 30 oscillators.

WEIGHT: 20#  
SIZE: 3-1/2" x 19" x 14" deep  
PRICE: (30 Oscillators) \$950.00



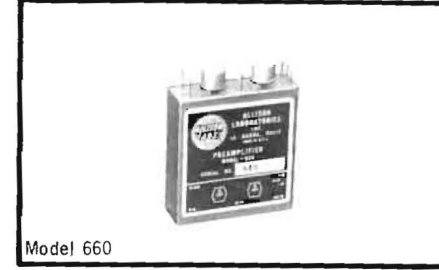
## AUTOMATIC INSPECTION UNIT MODEL 601A

The 601A is an improved solid state instrument for rapid automatic inspection of sound or vibration in any product. It consists of an optional transducer, amplifiers, variable filter, attenuator, meter and relay circuits to signal acceptance or rejection of the product under test. The high cutoff, low cutoff or band pass filters cover the range of 60 cps to 20 kcps. When set to pass objectional frequencies it will measure level and operate go - no go indicators or separating devices. This unit is used extensively on gears, bearings and similar products. The instruments may be made with 2 channels of filter and indicating circuits.

SIZE: 10-1/2" x 22" x 6-3/4"

WEIGHT: (Single channel) 33#

PRICE: Write giving your requirements for quotation.



## INSTRUMENTATION MODULES MODEL 660

Welded and encapsulated modules are easily adapted to your circuitry whether breadboard or production. The Model 660 is a very low noise flexible pre-amplifier having adjustable gain and bandwidth. Using only 1 MA of 13.5 to 22.5 VDC it saves space and power. The feedback loop is brought out to pins on the top of the module. This allows customer selection of feedback value for gain and resulting bandwidth. Turned circuits may also be inserted for selective amplification. Molded in 6-32 inserts simplify mounting. Transistors are readily serviced since sockets are also molded in.

GAIN AT 1 KCPS	20 to 40 db.
GAIN STABILITY	±.5 db 0°c to 50°c.
INPUT IMPEDANCE	40,000 ohms.
AVERAGE CURRENT	1 MA.
SIGNAL TO NOISE RATIO	85 db.
FREQUENCY RESPONSE	20db 10 cps to 1 mcs. 40db 10 cps to 50 kc.
1 - 9	\$33.00

See pages 12 & 13 for more new modules to extend power and signal conditioning capabilities of these handy building blocks.



## MODEL 659 (class B)

Another welded and encapsulated module designed to be used in filter driver applications. An output of 6 volts into 600 ohms with an input impedance of 40,000 ohms makes it suitable for many other circuits. Again, as in the Model 660, it has an open feedback loop for variation of gain and bandwidth. Used in conjunction with the Model 660 and 671 meter system it forms a transistorized voltmeter with sensitivity to .001 volts rms.

GAIN AT 1 KCPS	30 to 40 db.
GAIN STABILITY	.5 db 0° to 50°c.
INPUT IMPEDANCE	40,000 ohms.
AVERAGE CURRENT	2 to 17 MA.
FREQUENCY RESPONSE	30db 10 cps to 400 kcps 40db 10 cps to 100 kcps

PRICE 1-9: \$40.00

## MODEL 658 (class A)

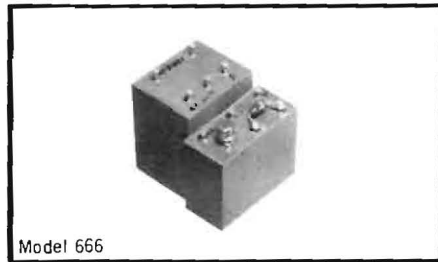
For multiple channel use from common power source use Model 658. Same performance on constant 12 MA.

## VARIABLE GAIN KIT MODEL 661

Provides self mounted variable control as well as shielding when used in multiples for high gain applications.

PRICE: \$8.50





Model 666

### POWER SUPPLY MODEL 666

The Allison Model 666 regulated power supply is a solid state dual module device. Designed primarily for the operation of various Allison modules, it may be used for many other instrumentation applications.

The two unit design offers a variation of mounting arrangements for minimum space and convenience. It also allows variation on the transformer when somewhat larger or smaller power requirements occur.

The 666 will produce 100 milliamps of well regulated 25 volts for operation of as many as 6 Model 659, 8 Model 658, 10 Model 660 or combinations of these.

#### SPECIFICATIONS

INPUT POWER:	110-130 50-60 cps 5 V.A.
OUTPUT VOLTAGE:	24 VDC $\pm$ 2V
CURRENT OUTPUT:	100 Milliamps DC Max.
OUTPUT RIPPLE:	3 Millivolts.
SIZE:	Trans.                      Rect. - Reg.
	1-13/16 x 1-1/2 x 2-1/2    1 x 2-1/8 x 2-1/8
WEIGHT:	8 oz.
PRICE:	\$52.50

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Model 671

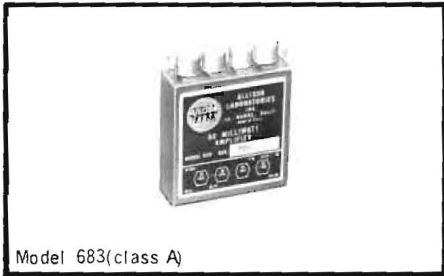
### METER SYSTEM MODEL 671

This model offers an extremely simple method of monitoring AC voltages or decibels in systems or instrumentation. The full wave bridge rectifier is welded and encapsulated for easy mounting either adjacent or remotely from the meter. Used with the Models 660 and 658, it forms a transistorized voltmeter with .001 volts sensitivity and frequency response from 10 cps to 50 kcps. Meters are available with either or both AC volts and decibels. The meter used is a 2-1/2" standard 3 screw mounting type. Indication is quasi rms. An extra terminal is provided for either slow or fast meter damping for measurement of constant or fluctuating voltages.

#### SPECIFICATIONS

SENSITIVITY:	"0" db = .66 volts +10 db = 2.1 volts
FREQUENCY RESPONSE:	-.5 db at 20 cps & 600 kcps
INPUT IMPEDANCE:	19 k ohms
PRICE:	\$45.00 (Standard scale)

## PRELIMINARY ANNOUNCEMENT OF NEW PRODUCTS



Model 683(class A)

### NEW ALL SILICON 60 MILLIWATT AMPLIFIER MODEL 683(class A)

The use of newly developed PNP silicon transistors in push pull circuitry makes this new module possible. Compact and highly reliable, it has excellent specifications for noise, variable gain, distortion, stability and other characteristics. This operates full Class A with a constant current of 12 milliamps at 22.5VDC. Frequency response of -1db at 10cps and 240kcps. Output 6 volts into 600 ohms.

### MODEL 684(class B)

The Class B counterpart of the above unit for use where minimum current usage is a requirement.

Most all specifications the same except average current is 2.4 milliamps with no signal.

1 -	9	\$55.00
10 -	24	48.50
25 -	49	42.00
50 -	100	38.50



Model 195

### CONTINUOUSLY VARIABLE INDUCTOR MODEL 195

A brand new aid to designers is a continuously variable inductor with a range of 10,000 to 1. (1 millihenry to 10 henries). Compact and simple in operation, it has the full range in 8 steps in a 1-3.2, 3.2-10 series.

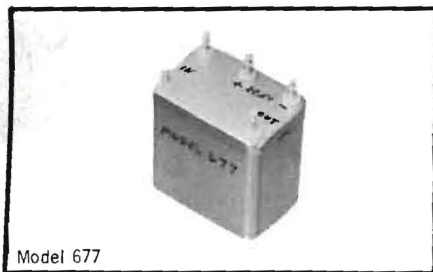
The inductor has many applications including equalizers, filters, oscillators, adjustable delay networks and adjustable phase shift networks, plus many others.

Tuning is accomplished by the patented Allison variable inductor which has proved itself in many years of fine performance in our continuously variable filters.

Write for specifications and curves of inductance, Q, frequency response and other characteristics.

Size: 5 1/2" W x 8 1/2" H x 5 D

Price \$95.00 each



Model 677

## LINEAR RECTIFIER MODEL 677

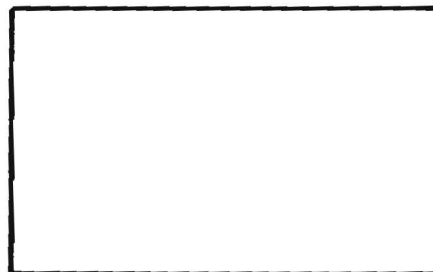
A solid state rectifier having a 40 db linear range. This unit produces a linear analog of AC voltage presented to it over the range of .05 to 5 volts. Complex voltages are converted on a quasi rms basis. Input frequency range is 20 cps to 20 kcps  $\pm 5$  db. Input impedance is approximately 600 ohms and is designed to work from a low impedance output such as the Model 659. Output DC voltage is approximately twice the AC input and the output impedance is 10,000 ohms and designed to work into a load of 100,000 ohms or more.

SIZE:  $1\frac{1}{2}$ "  $\times$  1"  $\times$   $1\frac{1}{4}$ "

WEIGHT: 3 oz.

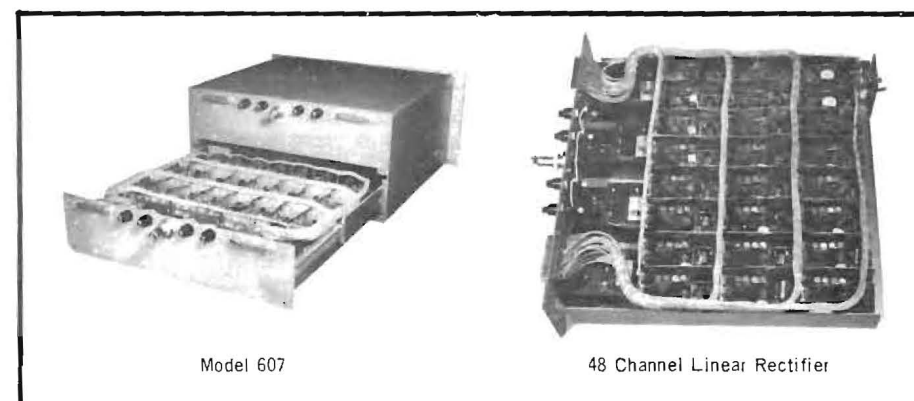
### PRICE

We expect the price to be \$36.75



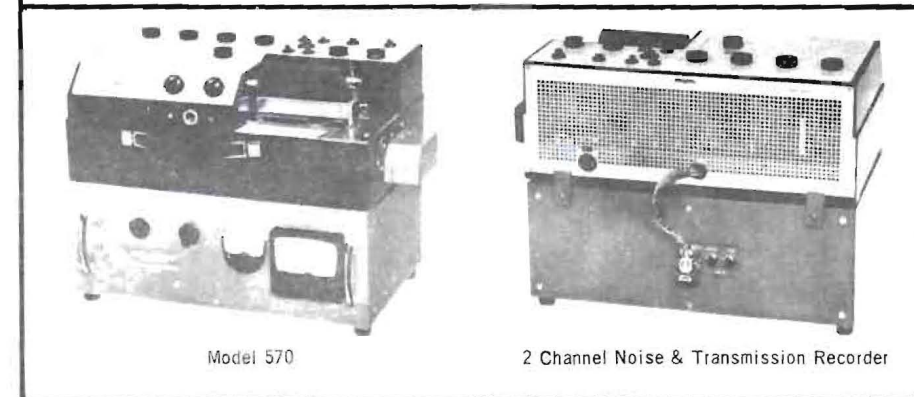
THIS SPACE  
RESERVED FOR ANOTHER  
NEW ITEM COMING  
SOON.

( LOG AMPLIFIER )



Model 607

48 Channel Linear Rectifier



Model 570

2 Channel Noise & Transmission Recorder

## SPECIAL INSTRUMENTS CONSTRUCTED WITH ALLISON MODULES

Above are two examples of special instruments designed and produced by Allison Labs. The complete familiarity with our building blocks and their application makes it possible for us to save you many engineering and test hours. Send your problems in the area of filtering, amplification, rectification, analysis, etc.

We cover the full frequency range between a fraction of 1 cps to 1 megacycle in control, amplification, rectification. Filters range from 1 cps to 600 kcps. The use of welded solid state circuitry prevents microphonics and provides minimum maintenance with maximum reliability.

If you haven't seen just what you need — write giving your specifications. We may be able to adapt a standard unit to your application or have what you want in development.



IN DEVELOPMENT

Allison Labs is constantly searching for new instruments and instrumentation components to broaden our coverage of the sub audio, audio and low RF range. We are particularly working on filtering, signal conditioning and analysis equipment. In addition to increasing the number and variety of off-the-shelf equipment available to you, we welcome your special applications which may require new methods and techniques or special adaptations of our standard equipment. Many special filters have been made by combining or dividing our stock type instruments.

Items now in development which may solve some of your problems are:

- 1. New low frequency amplifiers to be welded and encapsulated will join the module family. Response to .05 cps and out to 600 kcps in one unit. Probable 2 models differentiated by input and output impedance requirements.
- 2. Two more additions to the Random Noise Source similar to the Model 655. One low frequency which will use the above amplifier and produce a good random signal down to .05 cps. The second to extend the range to at least 1 megacycle on the upper end.

- 3. A new meter system to provide wide range measurements (100-1) of either AC voltage or db for sinusoidal or complex wave forms. The meter will be calibrated in linear DB (40) or logarithmic volts RMS. With expanded range much decade range switching will be avoided.
- 4. Higher power modular amplifiers with bandwidths from 5 cps to 500 kcps and power to 30 watts which will be combinable to produce 60 watts. Small package and good thermal stability will be additional features.
- 5. New applications for the excellent 1/3 octave filters in equalizer-analyzer applications. Spectrum shapers with ranges from 2.5 cps to 200 kcps. Featuring slide attenuators for ease of setting and reading.
- 6. A new package for our long proved variable inductor. Just the inductor but with range of as much as 10,000 to 1 variation in 1 package. (1 millihenry to 10 henrys). A very handy tool in the laboratory.
- 7. Additional modular power supplies similar to the model 666 which will supply power to our new power amplifiers.

Again if you haven't seen what you need in this, please write - it may be possible in our bag of tricks.

CONVERSION OF VOLTAGE AND DECIBELS

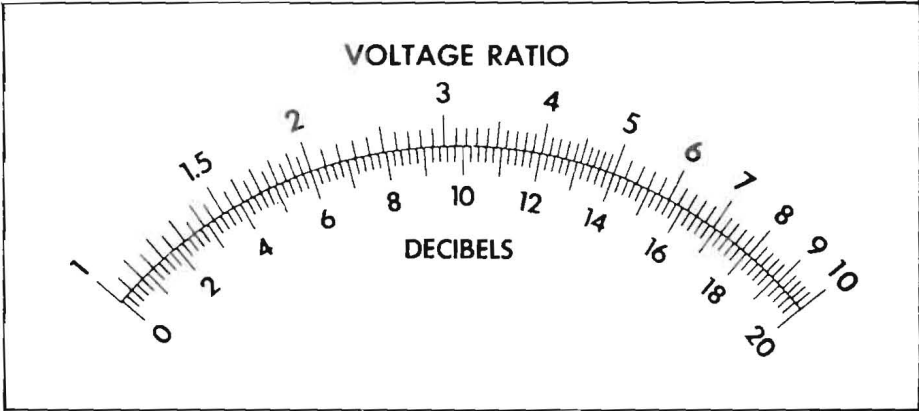
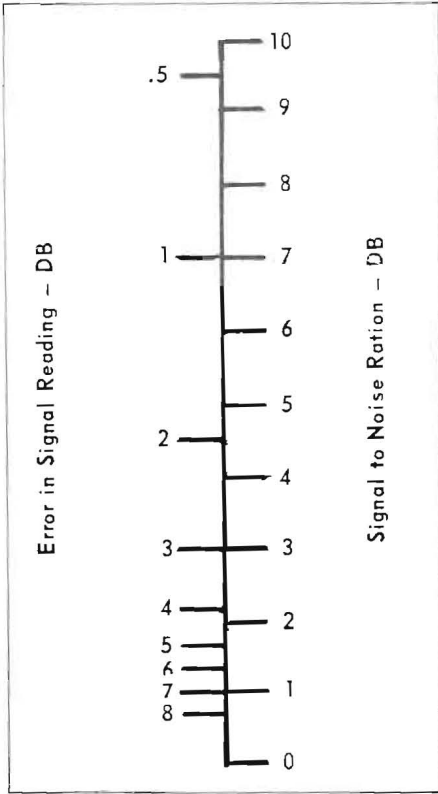


Chart for correction of signal measurement with the presence of background noise.



REFERENCE VOLTAGE

Points for "0"	DB
1MW into 50 Ω	.22 V
1MW into 72 Ω	.267 V
1MW into 600 Ω	.775 V
6MW into 500 Ω	1.72 V
6MW into 600 Ω	1.89 V

**RANDOM NOISE.** Random noise is an oscillation whose instantaneous magnitude is not specified for any given instant of time. The instantaneous magnitudes of a random noise are specified only by probability distribution functions giving the fraction of the total time that the magnitude, or some sequence of magnitudes, lies within a specified range.

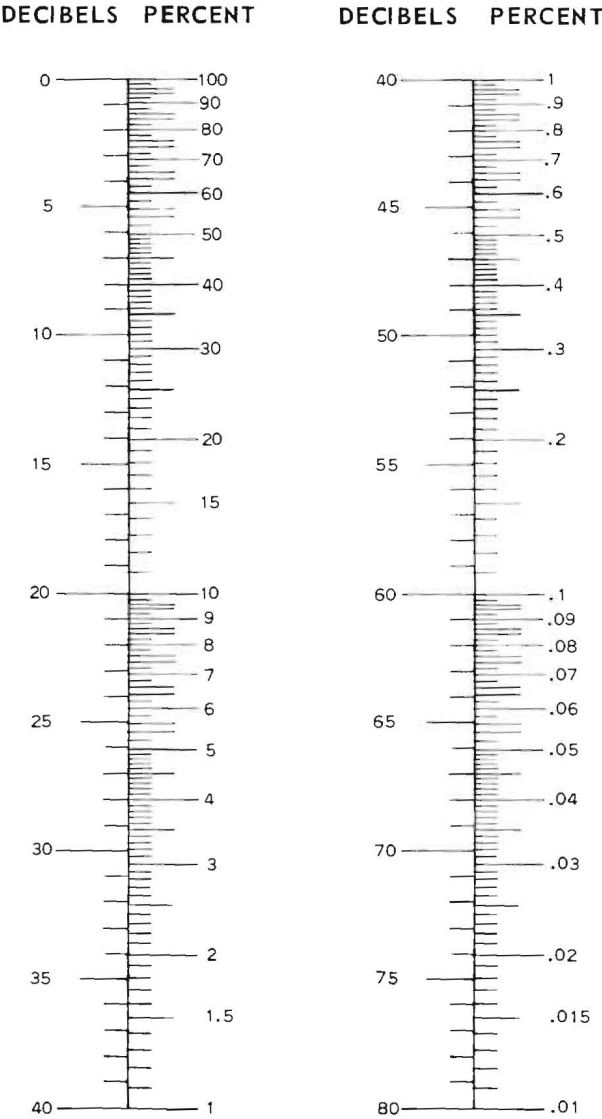
NOTE: A random noise whose instantaneous magnitudes occur according to the Gaussian distribution is called "Gaussian random noise."

**WHITE NOISE.** White noise is a noise whose spectrum density (or spectrum level) is substantially independent of frequency over a specified range.

NOTE: White noise need not be random.

SOURCE-ASA S1.1-1960

DECIBEL TO PERCENT  
CONVERSION CHART



EXAMPLE: A Signal to Noise Ratio of 40 DB = 1.0% Distortion

TABLE OF PREFERRED FILTER CENTER FREQUENCIES AND THEIR HIGH CUTOFF AND LOW CUTOFF FREQUENCIES. PREFERRED CENTER FREQUENCIES ARE SPECIFIED IN ASA SPECIFICATION S 1.6-1960. FOR HIGHER OR LOWER FREQUENCIES MULTIPLY OR DIVIDE BY FACTORS OF 10.

OCTAVES			1/6 OCTAVES		
CENTER FREQUENCY	LOW CUTOFF	HIGH CUTOFF	CENTER FREQUENCY	LOW CUTOFF	HIGH CUTOFF
31.5	22.4	45	20	19.1	21.2
63	45	90	22.4	21.2	23.7
125	90	180	25	23.7	26.5
250	180	355	28	26.5	29.7
500	355	710	31.5	29.7	33.4
1000	710	1400	35.5	33.4	37.6
2000	1400	2800	40	37.6	42.4
4000	2800	5600	45	42.4	47.7
8000	5600	11200	50	47.7	53.0
16000	11200	22400	56	53.0	61.4
31500	22400	45000	63	61.4	66.7

1/3 OCTAVES		
CENTER FREQUENCY	LOW CUTOFF	HIGH CUTOFF
25	22.36	28.06
31.5	28.06	35.49
40	35.50	44.76
50	44.76	56.12
63	56.12	70.98
80	70.98	89.43
100	89.43	111.79
125	111.79	141.97
160	141.97	178.86
200	178.86	223.58
250	223.58	280.58

ASA STANDARDS MAY BE PROCURED FROM:

AMERICAN STANDARDS ASSOCIATION INC.  
10 E. 40th St.  
NEW YORK 16, NEW YORK



# NETWORKS CAUSING AN INSERTION LOSS OF . . .

	FIGURE A		FIGURE B		FIGURE C		FIGURE D	
LOSS OF DB	a	b	$\frac{1}{b}$	$\frac{1}{a}$	a	$\frac{1}{a}$	c	$\frac{1}{c}$
.5	.028775	17.362	.05797	34.753	.028775	34.753	.059254	16.877
1.0	.057517	8.6643	.11542	17.386	.057517	17.386	.12205	8.1931
2.0	.11462	4.3048	.23230	8.7242	.11462	8.7242	.25893	3.8621
3.0	.17100	2.8385	.35230	5.8481	.17100	5.8481	.41254	2.4240
4.0	.22627	2.0966	.47697	4.4194	.22627	4.4194	.58489	1.097
5.0	.28013	1.6448	.60797	3.5698	.28013	3.5698	.77828	1.2849
6.0	.33228	1.3386	.74704	3.0095	.33228	3.0095	.99526	1.0048
7.0	.38248	1.1160	.89604	2.6145	.38248	2.6145	1.2387	.80727
8.0	.43051	.94617	1.0569	2.3229	.43051	2.3229	1.5119	.66143
9.0	.47622	.81183	1.2318	2.0999	.47622	2.0999	1.8184	.54994
10.0	.51949	70,273 *	1.4230	1.9250	.51949	1.9250	2.1623	46,248*
20.0	.81818	20,202*	4.9500	1.2222	.81818	1.2222	9.0000	11,111*
30.0	.93869	6,330.9*	15.769	1.0653	.93869	1.0653	30.623	3,265.5*
40.0	.980198	2,000.2*	49.995	1.0202	.980198	1.0202	99.000	1,010.1*
50.0***	.99370	632.46*	158.11	1.0063	.99370	1.0063	315.23	317.23*

\*THESE VALUES HAVE BEEN MULTIPLIED BY 10<sup>5</sup>

$$e = \frac{(e^A - 1)}{(e^A + 1)} \quad f = \frac{2e^A}{(e^{2A} - 1)} \quad c = e^A + 1 \quad d = 1 - e^{-A}$$

WHERE  $e = \text{LOG}_{10}^{-1} \left( \frac{\text{DB}}{20} \right)$  AND  $e^{2A} = \text{LOG}_{10}^{-1} \left( \frac{\text{DB}}{10} \right)$

THE ITERATIVE IMPEDANCES OF THE NETWORKS IN FIGS A, B, C & D ARE 1 OHM (=Z<sub>K1</sub>). IN FIGURE E Z<sub>K2</sub> = e<sup>-A</sup> OHMS AND IN FIG. F, Z<sub>K3</sub> = e<sup>A</sup> OHMS

# . . VARIOUS DB WHEN INSERTED BETWEEN 2 TERMINAL RS OF 1 OHM EA.\*\*\*

FIGURE E		FIGURE F		FIGURE G	FIGURE H
d	$\frac{1}{c}$	c	$\frac{1}{d}$	2c	$\frac{1}{2}c$
.055939	16.877	.059254	17.877	.11851	8.4383
.10878	8.1931	.12205	9.1931	.24411	4.0966
.20567	3.8621	.25893	4.8621	.51785	1.9311
.29205	2.4240	.41254	3.4240	.82507	1.2120
.36904	1.7097	.58489	2.7097	1.1698	.85486
.43766	1.2849	.77828	2.2849	1.5566	.64244
.49881	1.0048	.99526	2.0048	1.9905	.50238
.55332	.80727	1.2387	1.8073	2.4775	.40363
.60189	.66143	1.5119	1.6614	3.0238	.33071
.64519	.54994	1.8184	1.5499	3.6368	.27497
.68377	46,248*	2.1623	1.4625	4.3246	23,124
.90000	11,111*	9.0000	1.1111	18.000	5,555.6 *
.96838	3,265.5*	30.623	1.0327	61.246	1,632.8*
.99000	1,010.1*	99.000	1.01010	198.00	505.05*
.99684	317.23*	315.23	1.00317	630.46	158.62*

\*\*THIS CHART BASED ON 1 OHM CIRCUITS. THIS DATA MAY BE USED TO CALCULATE PADS OF ANY IMPEDANCE BY MULTIPLYING EACH OF THE VALUES BY THE DESIRED IMPEDANCE.

\*\*\* FOR PADS OF GREATER THAN 50 DB USE TWO PADS IN SERIES IN A SHIELD TO PREVENT ELECTROSTATIC PICKUP AND FEED THRU.

## UNITED STATES

If you are in an area without present reps, please contact the factory in writing or call collect to 213-691-0115 or 697-7698. We will provide instruments for trial in these areas just as our reps do in their territories.

### Alaska:

Arva, Inc.  
P.O. Box 171  
Anchorage, Alaska  
BRoadway 2-6731

### Arizona, Clark County, Nevada:

Williams - Associates  
1608 E. Earl  
Phoenix, Arizona  
277-7858

### California (northern):

Dynamic Associates  
1011 D Industrial Way  
Burlingame, California  
344-2521

### California (Southern)

Phillip Diamond Enterprises  
13615 Victory Blvd.  
Van Nuys, California  
873-6822

### Illinois, Indiana, Iowa, Kentucky and Eastern Wisconsin

R. Edward Stemm  
5681 W. Lake street  
Chicago, Illinois 60644  
379-2700 (312)

### Colorado, Nebraska, Wyoming and Eastern Montana:

Williams - Associates  
4971 Jackson Street  
Denver 16, Colorado  
388-4391

### Hawaii:

Al Michel  
949 McCully Street  
Honolulu, Hawaii  
993-149

### Massachusetts, Rhode Island, Maine, Vermont and New Hampshire:

Burlingame Associates  
7 Wellington Street  
Waltham 54, Massachusetts  
TWinbrook 4-1955

## ALLISON AUTHORIZED REPRESENTATIVES

### Michigan:

The Tiby Company  
8701 Fenkell Avenue  
Detroit 38, Michigan  
TEXas 4-9211

### Minnesota, North & South Dakota and western Wisconsin:

Pat Lind Electronics Company  
9781 Western Avenue  
Circle Pines, Minnesota  
781-6568

### New Mexico and El Paso County, Texas

Williams - Associates  
3221 Silver Avenue, S. E.  
Albuquerque, New Mexico  
255-9632

### New York (N.Y.C. area), New Jersey and Connecticut:

Burlingame Associates  
510 So. Fulton Avenue  
Mt. Vernon, New York  
MOunt Vernon 4-7530

### New York (northern area):

Burlingame Associates  
106 Pickard Building  
East Molloy Road  
Syracuse, New York  
454-2408

### Ohio, western Pennsylvania:

The Tiby Company  
2245 Warrensville Center Road  
Cleveland 18, Ohio  
EReview 1-5335

### Ohio:

The Tiby Company  
1954 North Main Street  
Dayton 5, Ohio  
CRestview 7-3822

### Oregon:

Arva, Inc.  
2035 S.W. 58th Avenue  
Portland 1, Oregon  
CApital 2-7337

### Pennsylvania (Philadelphia area):

Burlingame Associates  
222 Long Lane  
Upper Darby, Pennsylvania  
JAckson 8-6080

### Utah:

Williams - Associates  
362 Pierpont Avenue  
Salt Lake City 1, Utah  
328-3101

### Washington, Idaho and western Montana:

Arva, Inc.  
1320 Prospect Street  
Seattle 9, Washington  
MAin 2-0177

### Washington:

Arva, Inc.  
E. 127 Augusta Avenue  
Spokane 10, Washington  
FA 5-2557

### Washington D.C., Maryland, Delaware and northern Virginia:

Burlingame Associates  
8218 Wisconsin Avenue  
Washington 14, D.C.  
OLiver 4-6400

## FOREIGN REPRESENTATIVES

### Australia:

Ronald J. T. Payne Pty. Ltd.  
385-389 Bridge Rd., Richmond  
Victoria, Australia

### Canada:

Electrodesign  
9124 St. Lawrence Blvd.  
Montreal 11, Canada  
DUpont 9-5914

### Electrodesign

491 Lawrence Ave W.  
Toronto, Ontario  
RU 7-0991

### Electrodesign

168 Charlotte St.  
Ottawa, Ontario  
CEntal 4-9366

## AUTHORIZED ALLISON REPRESENTATIVES

### Canada: Nova Scotia, New Brunswick, Prince Edward Island, & Newfoundland

Electrodesign  
L. J. Payzant, Pres.  
P. O. Box 862  
Halifax, Nova Scotia

### Canada: Vancouver:

Arva, Inc.  
1624 W. 3rd Avenue  
Vancouver 9, B. C.  
REgent 6-6377

### England:

Livingston Laboratories, Ltd.  
31 Camden Road  
London N.W. 1, England

### France:

B. Freudenberg, Inc.  
50 Rockefeller Plaza  
New York 20, New York

### India:

K. Lal Bhakri  
P. O. Box 487  
New Delhi 1, India

### Italy:

Dott. Ing. Mario Vianello  
Via L. Anelli, 13  
Milano, Italy

Dott. Ing. Mario Vianello  
Via S. Croce in Gerusalemme, 97  
Rome, Italy

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Rikei Trading Co., Ltd.  
Kozato Kaikan Bldg.  
12, 2-Chome, Shiba Tamura-Cho  
Minato-Ku, Tokyo, Japan

### The Netherlands: Luxembourg and Belgium:

Hawinco n. v.  
Renssenstraat 13  
Arnhem, Holland

### Norway:

British Imports A/S  
Majorstuveien 35  
Oslo, Norway

### Sweden:

John C. Lagercrantz  
Vartavagen 57  
Stockholm, Sweden

### Switzerland, Germany & Austria:

Elektronik  
Postcheck-KTO: 1X15 575  
Schann/FL, Switzerland

Omni Ray GmbH  
Nymphenburger Strasse 164  
München 19, Germany

Austronik GmbH  
Vienna, Austria



	FIGURE A		FIGURE B		FIGURE C		FIGURE D		FIGURE E		FIGURE F		FIGURE G		FIGURE H	
LOSS OF DB	a	b	1/b	1/a	a	1/a	c	1/c	d	1/c	c	1/d	2c		1/2c	
.5	.028775	17.362	.05797	34.753	.028775	34.753	.059254	16.877	.055939	16.877	.059254	17.877	.11851		8.4383	
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40.0	.980198	2,000.2*	49.995	1.0202	.980198	1.0202	99.000	1,010.1*	.99000	1,010.1*	99.000	1.01010	198.00		505.05*	
50.0***	.99370	632.46*	158.11	1.0063	.99370	1.0063	315.23	317.23*	.99684	317.23*	315.23	1.00317	630.46		158.62*	

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